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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/554,700	10/27/2005	Helmuth Holler	P70873US0	9652

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EXAMINER	
MA, JAMESON Q	

ART UNIT	PAPER NUMBER
1775	

MAIL DATE	DELIVERY MODE
12/08/2010	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/554,700	HOLLER ET AL.	
	Examiner	Art Unit	
	JAMESON Q. MA	1775	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *21 September 2010*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1 and 3-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1 and 3-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

2. Claims 1, 3-8, 18, and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over McMaster (Nondestructive Testing Handbook) in view of The Shodor Education Foundation (hereinafter 'Shodor,' Gas Laws) and Biersach (US 5,006,391).

Regarding claims 1, 4-6, 18, and 20 McMaster teaches a method of leak testing a component on at least one side of a component having a cavity, comprising on at least one side of the component to be tested, completely wetting with a film of foam-forming liquid (see P27/C1/L27-38), subjecting the component to a temperature increase (see P27/C2/L40-47), and checking the component test area for a bubble formation of the testing liquid (see P27/C1/L27-38) and wherein the test component is not completely immersed. It is noted that the reference teaches heating, and it is interpreted that heating is performed by some form of irradiation.

The reference does not explicitly disclose that the component is made from a composite material consisting of at least a cover layer and a construction core having a plurality of cavities.

Biersach discloses a new and improved honeycomb core and honeycomb panel which is fabricated from corrugated fiberglass sheet and a resin core that is filled with fiber for strength (see abstract). Biersach discloses that an internal flange 74 is extendible around the entire periphery of a first surface sheet providing *hermetic sealing*

to the second surface sheet (see C5/L29-34). Biersach further discloses that the new and improved honeycomb sheet is usable while submerged and while floating on water (see C5/L35-42).

It would have been obvious to one of ordinary skill in the art at the time of invention to use the leak testing method of McMaster on the honeycomb core of Biersach because doing so would allow for a quality control testing method to test the hermeticity of the honeycomb disclosed by Biersach, the hermeticity of which would be essential for the water submersion and water floating uses disclosed by Biersach.

Not specifically taught by modified McMaster is the step wherein the component area to be tested is cooled before being wetted with the testing liquid and the temperature increase being effected by allowing the component to heat to room temperature.

However, McMaster discloses that in bubble emission leak tests, it is essential to apply gas pressure to one side before wetting the other surface of the pressure boundary with inspection liquid (see P27/C2/L25-36). McMaster further discloses on P27-28 that techniques used to create the gaseous pressure differential are applying pressure to gas enclosed in the interior volume of the test object, prior heating of small test objects, or applying a partial vacuum above the surface of the bubble test fluid.

Shodor discloses the relationship of the Ideal Gas Law and further discloses that the Ideal Gas Law can be used to quantitatively determine how changing the pressure, temperature, and volume affects the system (see P2). Further, the Combined Gas Law shows that pressure and temperature of a closed system are directly proportional (see

P2). For example, raising the temperature of a gas in a closed system raises the temperature. Likewise, reducing the temperature of a closed system should also proportionally reduce the pressure of that system.

As the aim of the leak testing method of McMaster is to create a pressure differential across the leak testing boundary, it would have been obvious to one of ordinary skill in the art to reduce the temperature (cool) the component to be tested before being wetted, as taught by McMaster, in order to create a larger pressure differential across the boundary of the surface, as taught by both McMaster and Shodor.

Regarding claims 1 and 5 and limitations directed to the precise temperature of heating, the references are silent to these limitations. However, the routine experimental modification of this prior art done in order to ascertain the optimum properties of disclosed leak detection fails to render the applicant's claims patentable in the absence of unexpected results. See In re Aller, 105 USPQ 233 and MPEP 2144.05. At the time of invention a person having ordinary skill in the art would have found it obvious to optimize the temperature to which to heat the component in order to balance such properties as cost, possible damage to components due to heating at excessive temperatures, and the desired boundary pressure differential. A prima facie case of obviousness may be rebutted, however, where the results of the optimizing variable, which is known to be result-effective, are unexpectedly good. See In re Boesch and Slaney, 205 USPQ 215.

Regarding claim 3, not specifically taught is a method, characterized in that the cooling is effected to -30°C at the most. However, the routine experimental modification

of this prior art done in order to ascertain the optimum properties of disclosed leak detection fails to render the applicant's claims patentable in the absence of unexpected results. See In re Aller, 105 USPQ 233 and MPEP 2144.05. At the time of invention a person having ordinary skill in the art would have found it obvious to optimize the temperature to which to cool the component in order to balance such properties as cost, possible damage to components due to cooling at excessive temperatures, and the desired boundary pressure differential. A prima facie case of obviousness may be rebutted, however, where the results of the optimizing variable, which is known to be result-effective, are unexpectedly good. See In re Boesch and Slaney, 205 USPQ 215.

Regarding claim 7-8, the method of modified McMaster is viewed to teach the limitation wherein opposed portions of the component area to be tested are wetted with the testing liquid (see McMaster P27/C1/L27-38) and the formation of bubbles is viewed to be a 'marking'.

3. Claims 8-10 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over McMaster (Nondestructive Testing Handbook) in view of The Shodor Education Foundation (hereinafter 'Shodor,' Gas Laws) and Biersach (US 5,006,391) as applied to claims 1, 3-7, 18, and 20 above, and further in view of Hirota et al. (cited in prior Action, US 3,664,965).

The following rejection of claim 8 is in the alternative.

Regarding claims 8-10 and 19, modified McMaster discloses all of the claim limitations as set forth above.

Modified McMaster does not explicitly teach the limitations of the testing liquid being sprayed or brushed to the component area being tested.

Hirota '965 discloses applying a foam-forming composition to a structure (see C1/L13-20). Hirota '965 further discloses that the composition is externally applied to structures in leak detection testing, and that bubbles of sufficient durability are formed to cling to the point of origin, allowing inspection to occur a considerable time after testing (see C1/L49-54). Additionally, Hirota '965 teaches the method:

- wherein sites exhibiting bubble formation are marked (see C3/L1-3).
- wherein the testing liquid is applied by brushing at least the component area to be tested (see C2/L65).
- wherein the testing liquid is applied by spraying at least the component area to be tested (see C2/L65).

It would have been obvious to one of ordinary skill in the art at the time of invention to substitute for the testing liquid used in the method of modified McMaster, a film of the foam-forming liquid as taught by Hirota '965, in order to allow leak origins to precisely defined and remain visible for extended time periods. It would further have been obvious to one of ordinary skill in the art at the time of invention to spray or brush the testing liquid as taught by Hirota '965 because doing so would have resulted in nothing more than using exemplary known methods of applying a testing liquid to a surface to achieve predictable results in liquid application.

4. Claims 11-13 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over McMaster (Nondestructive Testing Handbook) in view of The Shodor Education

Foundation (hereinafter 'Shodor,' Gas Laws) and Biersach (US 5,006,391) as applied to claims 1, 3-8, 18, and 20 above, and further in view of Hirota et al. (cited in prior Action, US 4,113,673).

Regarding claims 11-13 and 15, modified McMaster discloses all of the claim limitations as set forth above. Modified McMaster does not explicitly disclose a method:

- further comprising after said testing, a step of removing the testing liquid by washing.
- wherein the washing process step is effected under pressure.
- characterized in that the washing process is mechanically assisted.
- wherein the washing step is mechanically assisted.

Hirota '673 discloses a method for leak-testing a component by applying a bubble forming substance to a test area (C5/L3-5). Hirota '673 further discloses removing the test liquid by washing with water at a pressure of $2kg/cm^2$ (C5/L65-67). In order to pressurize the water, this process must have inherently been mechanically assisted.

It would have been obvious to one of ordinary skill in the art at the time of invention to incorporate the washing methods of modified Hirota '965, as taught by Hirota '673, in order to prevent the test liquid from interfering with normal operation/use of the component.

5. Claims 5, 14, and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over McMaster (Nondestructive Testing Handbook) in view of The Shodor Education

Foundation (hereinafter 'Shodor,' Gas Laws) and Biersach (US 5,006,391) as applied to claims 1, 3-8, 18, and 20 above, and further in view of Goldfarb et al. (cited in prior Action, US 4,553,435).

The following rejection of claims 5 and 20 is in the alternative assuming arguendo that irradiation is not taught.

Regarding claims 5, 14, and 20, modified McMaster discloses all of the claim limitations as set forth above. While modified McMaster discloses that the component (test piece) is heated, the reference does not explicitly disclose the method wherein the component is heated by irradiation or infrared irradiation.

Goldfarb teaches an infrared heating lamp (see fig. 1: infrared lamp 31) used to heat components.

It would have been obvious to one of ordinary skill in the art at the time of invention to substitute for the heater in the method of modified McMaster, an infrared heat lamp as taught by Goldfarb, because doing so would have resulted in nothing more than the simple substitution of known heating elements to obtain predictable results in heating.

6. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over McMaster (Nondestructive Testing Handbook) in view of Biersach (US 5,006,391).

Regarding claim 16, McMaster teaches a method of leak testing a component on at least one side of a component having a cavity, comprising on at least one side of the component to be tested, completely wetting with a film of foam-forming liquid (see

P27/C1/L27-38), subjecting the component to a temperature increase (see P27/C2/L40-47), and checking the component test area for a bubble formation of the testing liquid (see P27/C1/L27-38) and wherein the test component is not completely immersed. It is noted that the reference teaches heating, and it is interpreted that heating is performed by some form of irradiation.

The reference does not explicitly disclose that the component is made from a composite material consisting of at least a cover layer and a construction core having a plurality of cavities.

Biersach discloses a new and improved honeycomb core and honeycomb panel which is fabricated from corrugated fiberglass sheet and a resin core that is filled with fiber for strength (see abstract). Biersach discloses that an internal flange 74 is extendible around the entire periphery of a first surface sheet providing *hermetic sealing* to the second surface sheet (see C5/L29-34). Biersach further discloses that the new and improved honeycomb sheets are usable while submerged and while floating on water (see C5/L35-42).

It would have been obvious to one of ordinary skill in the art at the time of invention to use the leak testing method of McMaster on the honeycomb core of Biersach because doing so would allow for a quality control testing method to test the hermeticity of the honeycomb disclosed by Biersach, the hermeticity of which would be essential for the water submersion and water floating uses disclosed by Biersach.

7. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over McMaster (Nondestructive Testing Handbook) in view of Biersach (US 5,006,391) and Goldfarb et al. (cited in prior Action, US 4,553,435).

The following rejection of claim 16 is in the alternative assuming arguendo that irradiation is not taught.

Regarding claim 16, modified McMaster discloses all of the claim limitations as set forth above. While modified McMaster discloses that the component (test piece) is heated, the reference does not explicitly disclose the method wherein the component is heated by irradiation or infrared irradiation.

Goldfarb teaches an infrared heating lamp (see fig. 1: infrared lamp 31) used to heat components.

It would have been obvious to one of ordinary skill in the art at the time of invention to substitute for the heater in the method of modified McMaster, an infrared heat lamp as taught by Goldfarb, because doing so would have resulted in nothing more than the simple substitution of known heating elements to obtain predictable results in heating.

8. Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over McMaster (Nondestructive Testing Handbook) in view of Biersach (US 5,006,391) or McMaster (Nondestructive Testing Handbook) in view of Biersach (US 5,006,391) and Goldfarb et al. (cited in prior Action, US 4,553,435) as applied to claim 16 above and further in view of Ueda et al. (cited in prior Action, US 2002/0012767).

Regarding claim 17, modified McMaster discloses all of the claim limitations as set forth above.

The reference is silent to the cover layer being a carbon fiber fabric.

Ueda discloses that honeycomb surface layers are made from carbon fiber reinforced plastic (see [0004]).

It would have been obvious to one of ordinary skill in the art at the time of invention to incorporate carbon fibers taught by Ueda into the honeycomb material taught by modified McMaster because doing so would have provided a strong fiber material that was resistant to water as required by modified McMaster (specifically Biersach).

Response to Arguments

9. Applicant's arguments filed 9/21/10 have been fully considered but they are not persuasive.

Applicant argues that McMaster is improperly applied as the primary reference. In response, it is noted that the selection of the primary reference for rejection is left to the discretion of the Examiner.

Contrary to applicant's suggestion that one of ordinary skill in the art would not look to the McMaster reference, it is asserted that one of ordinary skill in the art could apply the leak testing principles taught by McMaster broadly to the leak testing of any type of material.

Applicant asserts on page 10 that Biersach merely reveals that honeycomb panels are known per se in the art but that Applicant's claimed invention is directed to

leak testing of such materials. Applicant further asserts that Biersach is silent as to flaws or leaks that could be present in the honeycomb panel. In response, it is noted that McMaster is the primary reference and is viewed to correspond to leak testing to objects in general (see e.g., McMaster page 27, 'test objects'). Therefore, one of ordinary skill in the art who was presented with McMaster in view of Biersach would find it obvious to leak test an article described by Biersach to contain a hermetic seal. A hermetic seal implies that the object is airtight. One of ordinary skill in the art with a teaching of different methods of leak testing of generic objects (McMaster) would be able to apply such a leak testing method to a reference which gives a specific object (honeycomb panel) whose integral function is based upon a hermetic (airtight) seal.

Applicant asserts on pages 11-12 that McMaster teaches the opposite of a cooling step followed by an increase in temperature and that it in combination with Shodor does not teach the claimed sequence of cooling before heating. In response, and as was indicated in the Office Action, the aim of the leak testing method of McMaster is to create a pressure differential across the leak testing boundary and thus it would have been obvious to one of ordinary skill in the art armed with that knowledge in combination with the Shodor reference to cool the temperature at the leak testing boundary to create a larger subsequent pressure differential.

Applicant's remarks to the obviousness rejections on pages 13-15 of the response does not present any arguments that have not been addressed above.

Conclusion

10. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to JAMESON Q. MA whose telephone number is (571)270-7063. The examiner can normally be reached on M-F 8:30 AM - 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Marcheschi can be reached on (571)272-1374. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JM
December 3, 2010

/Michael A Marcheschi/
Supervisory Patent Examiner, Art Unit 1775